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(54) **Luminaire comprising shutter blades**

Blendenlamellen enthaltende Leuchte

Luminaire comprenant des lamelles d'obturation

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Description

This invention relates to a gate and shutter assembly for use in a luminaire, in other words a lamp unit, particularly, but not exclusively, for application in theatre, studio or other entertainment lighting, to provide a shaped spot of light.

In, for example, theatre lighting it is often desired to produce a square or rectangular patch of light so as to give the impression of light through a window, for instance. For this purpose, an aperture (gate) and shutter assembly is provided within the luminaire housing. The gate comprises a plate mounted transverse to the beam from the luminaire having a central aperture. A plurality of shutters (usually at least four) are provided each comprising a blade within the plane of the gate and a handle projecting out from the luminaire housing through a slot. By manipulating the handle for each blade, the operator can swivel the blade angularly through a range defined by the angular extent of the slot in the housing. He can also push the shutter in and out to reduce the amount of light passing through the gate. Commonly, two shutter blades are provided on either side of the gate, through slots disposed on opposite sides of the luminaire housing. The pair of shutters on one side of the gate is oriented at 90° relative to the pair on the other side.

The extent of motion of each shutter blade is therefore dictated by the angular extent, round the luminaire housing, of the slot through which the handle of that shutter blade passes. Each slot must, of course, extend from the central cavity of the luminaire right through to the outside of the housing where it can be manipulated by a human operator. However, a luminaire is a heavy item of equipment, and one that is often moved from one place to another. It is therefore necessary for the luminaire housing to be relatively strongly built. The portion of the luminaire housing lying behind the gate and shutter assembly comprises the light source, associated electrical components and the ellipsoidal reflector directing light forwardly from the light source. The portion of the luminaire housing forward of the gate and shutter assembly contains imaging lenses, which produce a beam focussed from the plane of the gate, so that the shape formed by the shutters is the shape in cross-section of the beam projected on the stage.

There are thus heavy components at either side of the gate and the shutter assembly, and linking the two are the material within the lands between the slots. In order to provide sufficient structural strength to the luminaire housing, it has hitherto been necessary to provide relatively thick lands between the slots, and this has dictated the maximum angular extent of the slots.

Unfortunately, this has placed a constraint on the freedom of the user to align the shutter blades, and in particular the constraint that it has not been possible to manipulate a given blade through an angle approaching $\pm 360^\circ/2n$, where n is the total number of shutter blades. Thus, in a four shutter arrangement it has not been pos-

sible to manipulate adjacent shutters (normally inclined at 90° neutrally) to a blade inclination of 180° (i.e parallel blades). This constraint limits the freedom of the lighting designer.

One solution previously adopted is to employ "off-set shutters" - that is, shutters in which the handle is not mounted in the centre of the shutter blade but is off-set to one side or at an angle to the blade. Such shutters are removable through the slots in the luminaire housing. In use, the operator can achieve a wider range of shutter angles by taking the shutter out, turning it over and re-inserting the other way round. However, there are several problems with this solution. Firstly, it is harder to use for an operator since a given handle position corresponds to two different shutter inclinations, depending on which way round the shutter is. Secondly, the shutter blades are, in use, subjected to intense heat so that they become red hot and warp. It is therefore difficult to remove and re-insert the shutters whilst the luminaire is in use or after the blades have become permanently distorted.

U.S. Patent Specification No. US-A-4,210,955 discloses a luminaire including a gate assembly in which shutter blades are mounted via slots and which is of the kind discussed in the opening page of the present specification.

In accordance with the present invention there is provided a luminaire as set out in claim 1.

Other aspects and preferred embodiments of the invention will be apparent from the following description of drawings or claims.

The invention will now be illustrated, by way of example only, with reference to the accompanying drawings in which:

FIG 1 shows schematically the optical structure of a luminaire assembly including a gate;

FIG 2 shows schematically a prior art arrangement of gate assembly;

FIG 3 shows schematically the components of a gate assembly according to an embodiment of the invention;

FIG 4 shows in greater detail the components of a gate assembly according to a preferred embodiment of the invention;

FIG 5 shows the gate assembly of FIGS 3 and 4 in use;

FIG 6 shows schematically the components of a gate assembly according to an alternative embodiment of the invention;

FIG 7 shows on an enlarged scale a side view of one of the components of the gate assembly of FIG 6; and

FIG 8 shows a plan view of the component of FIG 7.

Referring to FIG 1, the optical components of a luminaire for stage, studio or other entertainment use comprise a light source 100 (typically a 500W - 5Kw in-

candescent lamp) located at one focus of an ellipsoidal reflector 110. Light from the light source 100 and reflector 110 is projected forwardly through a central circular aperture in a gate plate 120. The gate plate is positioned so that substantially all the beam passes through the central aperture. A projection lens system 130, 140 collects the light passing through the gate plate 120 and provides a generally focussed beam, with the edges of the aperture of the gate plate approximately in focus on the stage. The components 100-140 are housed within a luminaire housing (not shown) and the shutter blades are provided adjacent the gate plate 120.

The mounting of the luminaire 100 may be as described in our UK patent application no. 9207085.3 filed on 31st March 1992 (agents ref 3251701) incorporated herein by reference.

Referring to FIG 2, in one particular known structure (employed in the Strand Lekolite [registered trade mark] spotlight available from Strand Lighting Ltd, the present applicants) a rear luminaire housing portion 200 receives the reflector 110 surrounded by a heat baffle 105. The gate assembly comprises a rear mounting collar 24 secured to the rear luminaire housing portion 200, and carrying four mounting posts 23a, 23b, 23c, 23d. To these a forward luminaire housing portion (not shown in FIG 2) is secured by screws, to mount the projection lenses 130, 140 shown in FIG 1.

Within the baffle 24 is provided an inner ring plate 22 which receives five separator plate 30a-30e between which are sandwiched four shutter blades 32a-32d, their handles projecting between the mounting posts 23a-23d which define four slots by virtue of the separation between the rear luminaire housing portion 200 and the forward luminaire housing portion. Optionally provided adjacent the shutter assembly is an iris 28, located against an upper pressure plate 29, and the upper pressure plate 29 is urged against the separator plates by a collar 27 carrying a plurality of leaf springs 33 and secured to the lower support collar 22 by a screw fitting 25, 26.

Referring to FIG 3, in an embodiment of the invention the luminaire housing comprises a rearward portion 200 and a forward portion 210; although not shown, the rearward portion 200 includes the reflector 110 and bulb or lamp 100 as in FIG 2, and the forward portion 210 extends forwardly to include the lenses 130, 140 shown in FIG 1. The rearward portion 200 includes two circumferential slots 201a, 201b, and the forward portion 210 includes likewise a pair of slots 202a, 202b. Each slot extends over an angle of greater than $360/4^\circ$ (where 4 is the number of slots), so that no lands exist between the slots. The structural connection between the rear portion 200 and the forward portion 210 is provided through the gate plate 120, in other words, the forward and rear halves 200, 210 are only mechanically interconnected through the gate plate 120. In a preferred embodiment, the luminaire housing 200, 210 and gate plate 120 are formed in a single casting operation, with an

inner core and two outer moulds. However, gate plate 120 could equally be welded to the rear portion 200 and forward portion 210 or any other method of providing an integral whole could be adopted. The gate plate 120 is therefore of sufficient thickness to provide a reliable structural connection between the two halves 200, 210 of the luminaire housing.

The housing/gate plate assembly may conveniently be formed from aluminium; suitable aluminium die casting techniques are well known.

Into each slot 201a, 201b, 202a-202b a shutter plate is insertable, as shown. The shutter plate 132a, 132b is generally similar to the construction employed in the prior art; that is, it has a handle portion projecting through the slot for manipulation by the operator, and a straight edged blade portion transverse to the axis of the handle portion. In the embodiment shown, the slots 202a-202d are sufficiently wide that the blades 132a, 132b etc can be inserted and withdrawn through the slots; this is generally not possible with currently available luminaire constructions.

Referring to FIG 3B in embodiments where the slots 201, 202 are provided in opposed pairs, the shutter blades 132a etc are maintained flat within the plane of the gate plate 120 by providing, for each pair of slots, a pressure plate 127 acting as a spring urging the blades and gate plate together; the pressure plates 127a, 127b (not shown) therefore fulfill the general function of the collar 27 of FIG 2. Each plate 127 is arranged to be insertable through a respective slot to engage the slot on the opposite side of the luminaire housing (as shown, the plate 127a is insertable through slot 202b so as in use to engage the edges of the slots 202b and 202a) and to exert resilient pressure between the edges of those slots and the shutter blades 132 inserted through those slots.

Referring to FIG 4, the assembly of FIG 3 is shown in greater detail. A shutter blade 132 comprises a handle portion 133 which is elongate and extends backwardly generally transverse to the straight shutter edge 134 (although the handle 133 could be inclined, it is preferred for ease of operation to provide the handle portion 133 normal to the blade 134). The land between the edge 134 and handle portion 133 is sufficiently broad that when the blade 134 is extended in normal use into the centre of the aperture within the gate plate 120, the rear edge of the land is not visible within the central orifice; some degree of curvature of the trailing edge is also preferred to reduce friction on the inner surface of the luminaire assembly. In other respects, the shape of the land is not critical.

According to this embodiment, a pair of edge retaining features 135a, 135b are provided which prevent the edges of the shutter blade 134 projecting through the central orifice in the gate plate 120. As shown the edge retaining features 135a, 135b are conveniently provided as upturned tabs at the edge of the shutter plate 132.

In this embodiment, since the shutter plate 132 is

of narrower overall width than the width of the slot 202 through which it is inserted, a blade retention feature is provided on the blade 132; the blade retention feature 136 conveniently comprises a barb sloping backwardly towards the handle portion 133, so as to allow the shutter blade to be readily inserted but not removed.

The shutter blade 132 is conveniently provided as a stainless steel pressing, and the barb 136 as a semi-pierce on the pressing.

Referring to FIG 4B, the spring plate 127 comprises an upper land 128 in the form of a generally ring shaped flat sheet, of outer diameter corresponding to that of the luminaire housing 210; the opposed sides of the ring 128 are truncated so as to limit the width of the plate 127 to be smaller than that of the slots 202 so that the plate 127 is insertable through the slots. The upper land 128 bears against the edges of the slots 202 in use.

A pair of upturned rims 129a, 129b are provided at either end of the plate 127, to engage the edges of the slots 202 on the outside of the luminaire housing 210 and laterally retain the plate 127 within the housing in use.

Continuous with the inner edge of the ring 128 is a frustoconical surface 150 at the lower edge of which is an inner annular ring 151 of inner diameter equal to or greater than the central aperture within the gate plate 120, so as not to obstruct into the central aperture of the gate plate. Splits (not shown) in the edges of the inner ring 151 and for 127 and 150 may be provided to localise the pressure exerted on the shutter blades 132 so that distortion of one shutter blade does not affect the retention of the other.

Conveniently, the pressure plate is formed as a stainless steel pressing.

Referring to FIG 4C, the arrangement in use of the components of FIGS 3 and 4 is shown. The pressure plate 127 shows, in cross-section, a lazy-Z shape providing a spring force between the upper land or ring 128 and the inner ring 151; since the upper ring 128 bears against the forward part of the luminaire housing at the forward edge of the slots 202, the inner ring 151 is urged towards the shutter blade 135 and gate plate 120, biasing the two together. The frustoconical portion 150 has a height corresponding generally to the height of the slot 202, and thus prevents light loss through the slots 202.

It will be seen that the pressure plate 127 exerts a resilient force which not only retains the shutter blade 132 within the luminaire housing, but also retains the pressure plate 127 itself, by virtue of the rims 129. This will be seen to greatly reduce the complexity of the assembly, as compared with the prior art for, for example, FIG 2, enabling this embodiment to operate entirely without screws or bolts, which thus greatly reduces the complexity of assembly and disassembly of the luminaire.

Typically, the number of components to be disassembled is reduced from 10 to three and the need for screwdrivers or other tools is greatly reduced with con-

sequent reduction in the time for which the luminaire is inactive whilst the blade and pressure plate is replaced.

The assembly of the gate and shutters is as follows. Firstly, the pressure plate 127 is inserted through a first slot 202b until the rim 129b engages the outer surface of the luminaire housing 210 (forward portion); as shown, a recessed ring may be provided at the forward edge of the slot 202a to accommodate the rim 129b. Then a shutter blade 132 is inserted through a slot 202b, between the gate plate 120 and the inner ring 151, and urged forward so that the barb 136 enters within the inner ring 151, trapping the shutter blade against accidental removal. The next shutter blade 132 is then inserted through the other slot 129b. A further spring plate 127b (not shown) is likewise inserted through the other pair of slots 201a, 201b with the outer land 127 bearing this time against the backwards edges of the slots 201a, 201b and the inner edges 151 towards the shutter plate 120, and a corresponding further pair of shutter blades 132 are inserted between the second pressure plate 127 and the gate plate 120.

To disassemble the components, the shutter plates are withdrawn until the barb 136 locates against the inner rim 151. A convenient tool (for example, a screwdriver) is then used to urge the inner rim 151 away from the shutter blade 132 to the extent necessary to withdraw the barb 136. After the blades 132 are withdrawn it is then possible to remove the pressure plate 127 through one of the slots 129a or 129b.

It is necessary to replace the shutter blades 132 relatively frequently because of the shape degradation caused by the heating to which they are subjected in use.

Referring to FIG 5, it will be seen that in use, a blade 132 can be rotated through an angle in excess of 90° (or, in general, 360/n° where n is the number of blades) by manipulation of the handle 133, and that the tabs 135 engage with the shutter plate 127 to prevent the corners of the blade entering within the gate aperture. The edges of a pair of blades through opposed slots 202a, 202b may therefore be brought parallel to one another if desired, or even manipulated further so that the two handle portions 133 define an acute angle, rather than the obtuse angles necessary in the prior art. A much greater range of beam shapes are therefore available to the lighting designer.

By way of example only, the shutter blades and pressure plate may be of stainless steel sheet thickness of SWG24.22 and the luminaire housing and gate plate assembly 210, 120 of aluminium alloy thickness 2.0-2.5mm, die cast. However, any other materials suitable for the mechanical and thermal conditions well known to exist within luminaires could equally be used.

It will be understood that many alternative embodiments and departures from the above construction will be possible to the skilled person. For example, although the above described embodiment provides a simple one piece luminaire assembly the principle of overlapping,

radially, the edges of the adjacent slots to provide greater ease of manipulation could be employed even with other types of luminaire housing in which the shutter plate 120 does not bear any mechanical load. Although only four shutter blades and slots have been shown, a greater or lesser number could, of course, be employed. Although the above described embodiment utilises a pair of shutter blades generally in the same plane inserted through opposed slots, more complex arrangements in which each shutter blade is in a separate plane could be provided. Although four shutter blades are shown, other numbers would be possible. Although the invention is described with reference to a luminaire for stage and studio lighting, it could equally be applied in other optical instruments.

The pressure plate 127 is conveniently inserted through the same slots as the shutter blade, but separate slots could be provided if desired for this purpose, or alternative fastenings provided internally within the housing 200.

Turning now to FIGS 6, 7, 8, in an alternative embodiment each pressure plate 127a, 127b is provided with a series of slats 261 formed from the frustoconical surface 150 and upper land surfaces 158 by piercing a corresponding series of slots 263. The slats 261 are designed to have differing lengths and are arranged over the plate 127 so as to ensure that there is a substantially even spring pressure over the contact surfaces, avoiding the problem of tight or loose spots. Furthermore, the corresponding slots 263 enable better ventilation of the housing 200.

Claims

1. A luminaire housing (200,210) comprising a plurality of circumferential slots (201,202) in which the handles of a plurality of shutter blades (132) are arranged to be slidable, and characterised in that the edges of adjacent slots (202,202) are radially overlapped around the circumference of the luminaire housing (201,202) so that each handle may be manipulated over an angular range approaching or exceeding $360/n^\circ$, where n is the number of slots and/or shutter blades (132).
2. A luminaire housing according to claim 1 in which the slots (201,202) are disposed as opposed pairs of facing slots (201a,b, 202a,b) lying in a common plane.
3. A luminaire housing according to claim 1 or claim 2 in which the slots (201,202) are sufficiently wide as to permit the insertion of a pressure plate acting on the shutter blades (132) therethrough.
4. A luminaire comprising a housing (200,210) according to any of claims 1 to 3, a plurality of shutter

blades (132) provided with handles (133) extending through the slots therein, and at least one spring member (127) retaining the blades (132) in a desired plane.

5. A luminaire according to claim 4 in which the spring member (127) comprises a resilient element acting between the housing (200,210) and the shutter blade or blades (132), the spring member comprising means for engaging the housing such that the resilience of the spring member (127) retains the spring member (127) within the housing (200,210) in use, and enabling it to be removed by overcoming its resilience.
6. A luminaire according to claim 5 in which the resilient element (127) includes a series of slatted members (261) designed so as to produce an even spring pressure over the regions contacted by the resilient element (127).
7. A luminaire according to any of claims 3 to 6 in which the spring member (127) comprises a first surface (129) engaging a feature of the housing (210), a second surface (151) engaging at least one shutter blade in use, and an inclined portion (150) connecting the two surfaces (129,151).
8. A luminaire according to claim 5, 6 or 7, in which the housing feature comprises the edge of a slot (202) within the housing (210).
9. A luminaire according to claim 8, in which the slot is one in which the handle (133) of a shutter blade (132) is adapted to slide.
10. A luminaire according to any of claims 3 to 9, in which each shutter blade (132) comprises a blade edge portion (134) at each end of which are disposed edge retaining features (135a,b) for preventing the respective edge end (134) from entering the central aperture of a gate plate (120) within the housing (200,210).
11. A luminaire according to claim 10, in which the retaining means comprise at least one detent (135a, 135b) extending out of the plane of the shutter blade (132) and cooperating with a circumferentially disposed feature within the assembly.
12. A luminaire according to claim 11, in which the circumferential feature comprises a portion of the spring member (127).
13. A luminaire according to any of claims 3 to 12, in which the or each shutter blade (132) includes a detent for preventing removal of the shutter blade (132) from the assembly in use.

14. A luminaire according to claim 13, in which the detent comprises a barbed feature for cooperation with a circumferentially disposed feature within the assembly, allowing the shutter to be inserted into the assembly but preventing its withdrawal therefrom in use. 5
15. A luminaire according to claim 14, in which the circumferential feature comprises the second surface of the spring member (127). 10
16. A luminaire according to any one of claims 13 to 15, wherein the or each shutter blade (132) comprises a blade edge portion and a handle portion (133) extending rearwardly therefrom, in which the blade edge portion includes, towards either end of the blade edge (134), retaining means (135) for preventing the respective edge end of the blade from entering the central aperture of the gate. 20
17. A luminaire according to claim 16, in which the retaining means comprise at either edge, a detent (135) extending out of the plane of the blade. 25
18. A luminaire according to any one of claims 13 to 17 including a gate plate (120) including a central gate aperture, the housing and the gate plate (120) comprising a unitary whole, there being provided slots at either side of the gate plate (120) running circumferentially through the housing (200,210) in a plane parallel to that of the gate plate, to permit the manipulation of the handle (133) of a shutter blade (132), in which the gate plate (120) is formed to transmit mechanical load between the portions of the housing (200,210) lying at either side thereof, so that it is unnecessary to provide load bearing means angularly separating adjacent slots at either side of the gate plate (120). 30 35
19. A luminaire according to claim 18, in which the gate plate (120) and housing (200,210) are formed together as a unitary body. 40
20. A luminaire according to claim 19, wherein the housing and the gate assembly are formed by die casting. 45
21. A luminaire according to either of claims 19 or 20 and comprising at least one spring member (127) biasing the shutter blades (132) generally into the plane of the gate plate (120). 50
22. A luminaire according to claim 12, in which the or each spring member (127) is retained in use within the housing by retaining means engaging the housing (210) by virtue of the resilience of the spring member (127). 55

23. A luminaire according to claim 22, in which the or each spring member (127) includes a wall portion (150) blocking the egress of light through the slot through which it is insertable.

24. A luminaire according to claim 23, in which the slots through which the spring members (127) are insertable are the slots (201) provided for the handles (133) of the shutter blades (132).

Patentansprüche

1. Gehäuse (200, 210) für eine Beleuchtungsanordnung mit einer Vielzahl von in Umfangsrichtung verlaufenden Schlitzen (201, 202), in denen die Griffe einer Vielzahl von Verschlussblättern (132) verschiebbar angeordnet sind, **dadurch gekennzeichnet, daß** sich die Kanten benachbarter Schlitze (201, 202) entlang des Umfangs des Gehäuses (201, 202) der Beleuchtungsanordnung radial überlappen, so daß jeder Griff über einen Winkelbereich, der sich an $360^\circ/n$ annähert oder diesen Wert übertrifft betätigt werden kann, wobei n die Zahl der Schlitze und/oder Verschlussblätter (132) darstellt.
2. Gehäuse nach Anspruch 1, wobei die Schlitze (202, 202) als gegenüberliegende Paare einander zugewandter, in einer gemeinsamen Ebene liegender Schlitze (202a,b, 202a,b) angeordnet sind.
3. Gehäuse nach Anspruch 1 oder 2, wobei die Schlitze (201, 202) ausreichend breit sind, um durch sie eine auf die Verschlussblätter (132) wirkende Druckplatte einführen zu können.
4. Beleuchtungsanordnung mit einem Gehäuse (200, 210) nach einem der Ansprüche 1 bis 3, mit einer Vielzahl von Verschlussblättern (132), die mit sich durch die darin vorgesehenen Schlitze erstreckenden Griffen (133) versehen sind, und mit mindestens einem Federelement (127), daß die Blätter (132) in einer gewünschten Ebene hält.
5. Beleuchtungsanordnung nach Anspruch 4, wobei das Federelement (127) ein zwischen dem Gehäuse (200, 210) und dem Verschlussblatt oder den Blättern (132) wirkendes elastisches Element und eine so in das Gehäuse eingreifende Einrichtung beinhaltet, daß die Elastizität des Federelements (127) dieses in Gebrauch innerhalb des Gehäuses (200, 210) hält, und die erlaubt, daß es unter Überwindung seiner Elastizität entfernt werden kann.
6. Beleuchtungsanordnung nach Anspruch 5, wobei das elastische Element (127) eine Serie von Lamellenelementen (261) aufweist, die so eingerichtet

sind, daß sie über die mit dem elastischen Element (127) in Berührung stehenden Bereiche eine gleichmäßige Federkraft erzeugen.

7. Beleuchtungsvorrichtung nach einem der Ansprüche 3 bis 6, wobei das Federelement (127) eine an einer Struktur des Gehäuses (210) angreifende erste Fläche (129), eine im Gebrauch an mindestens einem Verschußblatt angreifende zweite Fläche (151) und einen die beiden Flächen (129, 151) verbindenden geneigten Abschnitt (150) aufweist. 5
8. Beleuchtungsvorrichtung nach Anspruch 5, 6 oder 7, wobei die Gehäuse-Struktur die Kante eines Schlitzes (202) in dem Gehäuse (210) beinhaltet. 10
9. Beleuchtungsvorrichtung nach Anspruch 8, wobei der Schlitz ein solcher ist, in dem der Griff (133) eines Verschußblattes (132) verschiebbar ist. 15
10. Beleuchtungsvorrichtung nach einem der Ansprüche 3 bis 9, wobei jedes Verschußblatt (132) einen Blattkantenbereich (134) aufweist, an dessen jeweiligen Enden Kantenhaltestrukturen (135a,b) angeordnet sind, um zu verhindern, daß das entsprechende Kantenende (134) in die mittlere Apertur einer in dem Gehäuse (200, 210) vorgesehenen Fensterplatte (120) eintritt. 20
11. Beleuchtungsvorrichtung nach Anspruch 10, wobei die Halteeinrichtung mindestens eine aus der Ebene des Verschußblattes (132) herausragende Arretierung (135a, 135b) aufweist, die mit einer in Umfangsrichtung angeordneten Struktur in der Anordnung zusammenwirkt. 25
12. Beleuchtungsvorrichtung nach Anspruch 11, wobei die in Umfangsrichtung angeordnete Struktur einen Bereich des Federelements (127) beinhaltet. 30
13. Beleuchtungsvorrichtung nach einem der Ansprüche 3 bis 12, wobei das oder jedes Verschußblatt (132) eine Arretierung aufweist, um in Benutzung das Entnehmen des Verschußblattes (132) aus der Anordnung zu verhindern. 35
14. Beleuchtungsvorrichtung nach Anspruch 13, wobei die Arretierung eine Widerhaken-Struktur zur Zusammenwirkung mit einer in Umfangsrichtung angeordneten Struktur innerhalb der Anordnung aufweist, die es erlaubt, den Verschuß in die Anordnung einzuführen, aber verhindert, daß sie im Gebrauch aus ihr zurückgezogen wird. 40
15. Beleuchtungsvorrichtung nach Anspruch 14, wobei die in Umfangsrichtung verlaufende Struktur die zweite Fläche des Federelements (127) beinhaltet. 45

16. Beleuchtungsvorrichtung nach einem der Ansprüche 13 bis 15, wobei das oder jedes Verschußblatt (132) einen Blattkantenabschnitt und einen sich nach hinten davon wegerstreckenden Griffabschnitt (133) aufweist und der Blattkantenabschnitt in Richtung jedes Endes der Blattkante (134) Rückhalteeinrichtungen (135) beinhaltet, um zu verhindern, daß das entsprechende Kantenende des Blatts in die mittlere Apertur des Fensters eintritt.
17. Beleuchtungsvorrichtung nach Anspruch 16, wobei die Rückhalteeinrichtungen an jeder Kante eine aus der Ebene des Blatts vorstehende Arretierung (135) aufweisen.
18. Beleuchtungsvorrichtung nach einem der Ansprüche 13 bis 17 mit einer mit einer mittleren Fensterapertur versehenen Fensterplatte (120), die mit dem Gehäuse ein einheitliches Ganzes bildet, wobei auf jeder Seite der Fensterplatte (120) in Umfangsrichtung durch das Gehäuse (200, 210) in einer zur Fensterplatte parallelen Ebene verlaufende Schlitze vorgesehen sind, um die Betätigung des Griffs (133) eines Verschußblattes (132) zu erlauben, wobei die Fensterplatte (120) so ausgebildet ist, daß sie die Übertragung mechanischer Kräfte zwischen den auf jeder ihrer Seiten liegenden Abschnitten des Gehäuses (200, 210) erlaubt, so daß es überflüssig ist, lasttragende Einrichtungen vorzusehen, die in Winkelrichtung auf jeder Seite der Fensterplatte (120) benachbarte Schlitze trennen.
19. Beleuchtungsvorrichtung nach Anspruch 18, wobei die Fensterplatte (120) und das Gehäuse (200, 210) gemeinsam als einheitlicher Körper ausgebildet sind.
20. Beleuchtungsvorrichtung nach Anspruch 19, wobei das Gehäuse und die Fensteranordnung durch Druckguß hergestellt sind.
21. Beleuchtungsvorrichtung nach einem der Ansprüche 19 oder 20 mit mindestens einem Federelement (127), das die Verschußblätter (132) im wesentlichen in die Ebene der Fensterplatte (120) hinein vorspannt.
22. Beleuchtungsvorrichtung nach Anspruch 12, wobei das oder jedes Federelement (127) in Gebrauch mittels Rückhalteeinrichtungen, die aufgrund der Elastizität des Federelements (127) in das Gehäuse (210) eingreifen in dem Gehäuse zurückgehalten wird.
23. Beleuchtungsvorrichtung nach Anspruch 22, wobei das oder jedes Federelement (127) einen Wandabschnitt (150) aufweist, der den Lichtaustritt durch den Schlitz, durch den es einführbar ist, blockiert.

24. Beleuchtungsanordnung nach Anspruch 23, wobei die Schlitze, durch die die Federelemente (127) einführbar sind, diejenigen Schlitze (201) darstellen, die für die Griffe (133) der Verschlussblätter (132) vorgesehen sind.

Revendications

1. Un boîtier de luminaire (200, 210) comprenant une pluralité de fentes circonférentielles (201, 202) dans lesquelles les poignées d'une pluralité de lamelles d'obturation (132) sont agencées pour être coulissantes et caractérisé en ce que les bords des fentes contiguës (202, 202) se chevauchent radialement autour de la circonférence du boîtier de luminaire (201, 202), de sorte que chaque poignée puisse être manipulée sur une plage angulaire approchant ou dépassant $360/n^\circ$, où n est le nombre de fentes et/ou de lamelles d'obturation (132).
2. Un boîtier de luminaire selon la revendication 1, dans lequel les fentes (201, 202) sont disposées comme des paires opposées de fentes se faisant face (201a,b, 202a,b) disposées dans un plan commun.
3. Un boîtier de luminaire selon la revendication 1 ou la revendication 2, dans lequel les fentes (201, 202) sont suffisamment larges pour permettre l'insertion d'une plaque d'appui agissant sur les lamelles d'obturation (132) à travers celles-ci.
4. Un luminaire comprenant un boîtier (200, 210) selon l'une quelconque des revendications 1 à 3, une pluralité de lamelles d'obturation (132) pourvues de poignées (133) s'étendant à travers les fentes à l'intérieur de celui-ci, et au moins un élément de ressort (127) retenant les lamelles (132) dans un plan souhaité.
5. Un luminaire selon la revendication 4, dans lequel l'élément de ressort (127) comprend un élément élastique agissant entre le boîtier (200, 210) et la lamelle ou les lamelles d'obturation (132), l'élément de ressort comprenant des moyens destinés à se mettre en prise avec le boîtier de sorte que l'élasticité de l'élément de ressort (127) retienne l'élément de ressort (127) à l'intérieur du boîtier (200, 210) en utilisation, et permette de le retirer en surmontant son élasticité.
6. Un luminaire selon la revendication 5, dans lequel l'élément élastique (127) comprend une série d'éléments à lames (261) conçus pour produire une pression de ressort égale sur les régions en contact avec l'élément élastique (127).
7. Un luminaire selon l'une quelconque des revendications 3 à 6, dans lequel l'élément de ressort (127) comprend une première surface (129) se mettant en prise avec un élément du boîtier (210), une seconde surface (151) se mettant en prise avec au moins une lamelle d'obturation en utilisation, et une partie inclinée (150) reliant les deux surfaces (129, 151).
8. Un luminaire selon l'une quelconque des revendications 5, 6 ou 7, dans lequel l'élément de boîtier comprend le bord d'une fente (202) à l'intérieur du boîtier (210).
9. Un luminaire selon la revendication 8, dans lequel la fente est une fente dans laquelle la poignée (133) d'une lamelle d'obturation (132) est adaptée pour coulisser.
10. Un luminaire selon l'une quelconque des revendications 3 à 9, dans lequel chaque lamelle d'obturation (132) comprend une partie de bord de lamelle (134) à chaque extrémité de laquelle sont disposés des éléments de retenue de bords (135a,b) pour empêcher que l'extrémité de bord (134) respective entre dans l'ouverture centrale d'une plaque de fenêtre (120) dans le boîtier (200, 210).
11. Un luminaire selon la revendication 10, dans lequel les moyens de retenue comprennent au moins un arrêt (135a, 135b) s'étendant hors du plan de la lamelle d'obturation (132) et coopérant avec un élément disposé de manière circonférentielle dans l'assemblage.
12. Un luminaire selon la revendication 11, dans lequel l'élément circonférentiel comprend une partie de l'élément de ressort (127).
13. Un luminaire selon l'une quelconque des revendications 3 à 12, dans lequel la ou chaque lamelle d'obturation (132) comprend un arrêt pour empêcher l'enlèvement de la lamelle d'obturation (132) de l'assemblage en utilisation.
14. Un luminaire selon la revendication 13, dans lequel l'arrêt comprend un élément à barbe pour coopérer avec un élément disposé de manière circonférentielle dans l'assemblage, permettant d'insérer l'obturateur dans l'assemblage mais empêchant de le retirer de celui-ci en utilisation.
15. Un luminaire selon la revendication 14, dans lequel l'élément circonférentiel comprend la seconde surface de l'élément de ressort (127).
16. Un luminaire selon l'une quelconque des revendications 13 à 15, dans lequel la ou chaque lamelle

d'obturation (132) comprend une partie de bord de lamelle et une partie de poignée (133) s'étendant vers l'arrière de celle-ci, dans lequel la partie de bord de lamelle comprend, vers chaque extrémité du bord de lamelle (134), des moyens de retenue (135) pour empêcher l'extrémité de bord respective de la lamelle d'entrer dans l'ouverture centrale de la fenêtre.

17. Un luminaire selon la revendication 16, dans lequel les moyens de retenue comprennent à chaque bord, un arrêt (135) s'étendant hors du plan de la lamelle. 10
18. Un luminaire selon l'une quelconque des revendications 13 à 17, comprenant une plaque de fenêtre (120) comprenant une ouverture centrale de fenêtre, le boîtier et la plaque de fenêtre (120) comprenant un ensemble unitaire, des fentes étant prévues à chaque côté de la plaque de fenêtre (120) passant de manière circonférentielle à travers le boîtier (200, 210) dans un plan parallèle à celui de la plaque de fenêtre, pour permettre la manipulation de la poignée (133) d'une lamelle d'obturation (132), dans lequel la plaque de fenêtre (120) est formée pour transmettre une charge mécanique entre les parties du boîtier (200, 210) disposées à chacun de ses côtés, de sorte qu'il ne soit pas nécessaire de prévoir des moyens de support de charge séparant les fentes contiguës de manière angulaire à chaque côté de la plaque de fenêtre (120). 15
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19. Un luminaire selon la revendication 18, dans lequel la plaque de fenêtre (120) et le boîtier (200, 210) sont formés l'un avec l'autre comme un corps unitaire. 35
20. Un luminaire selon la revendication 19, dans lequel le boîtier et l'assemblage de fenêtre sont formés par moulage sous pression. 40
21. Un luminaire selon la revendication 19 ou 20 et comprenant au moins un élément de ressort (127) sollicitant les lamelles d'obturation (132) généralement vers le plan de la plaque de fenêtre (120). 45
22. Un luminaire selon la revendication 12, dans lequel le ou chaque élément de ressort (127) est maintenu, en utilisation, dans le boîtier par des moyens de retenue se mettant en prise avec le boîtier (210) en raison de l'élasticité de l'élément de ressort (127). 50
23. Un luminaire selon la revendication 22, dans lequel le ou chaque élément de ressort (127) comprend une partie de paroi (150) bloquant la sortie de lumière à travers la fente à travers laquelle il est susceptible d'être inséré. 55
24. Un luminaire selon la revendication 23, dans lequel les fentes à travers lesquelles les éléments de ressort (127) peuvent être insérés sont les fentes (201) prévues pour les poignées (133) des lamelles d'obturation (132). 5

FIG. 1.

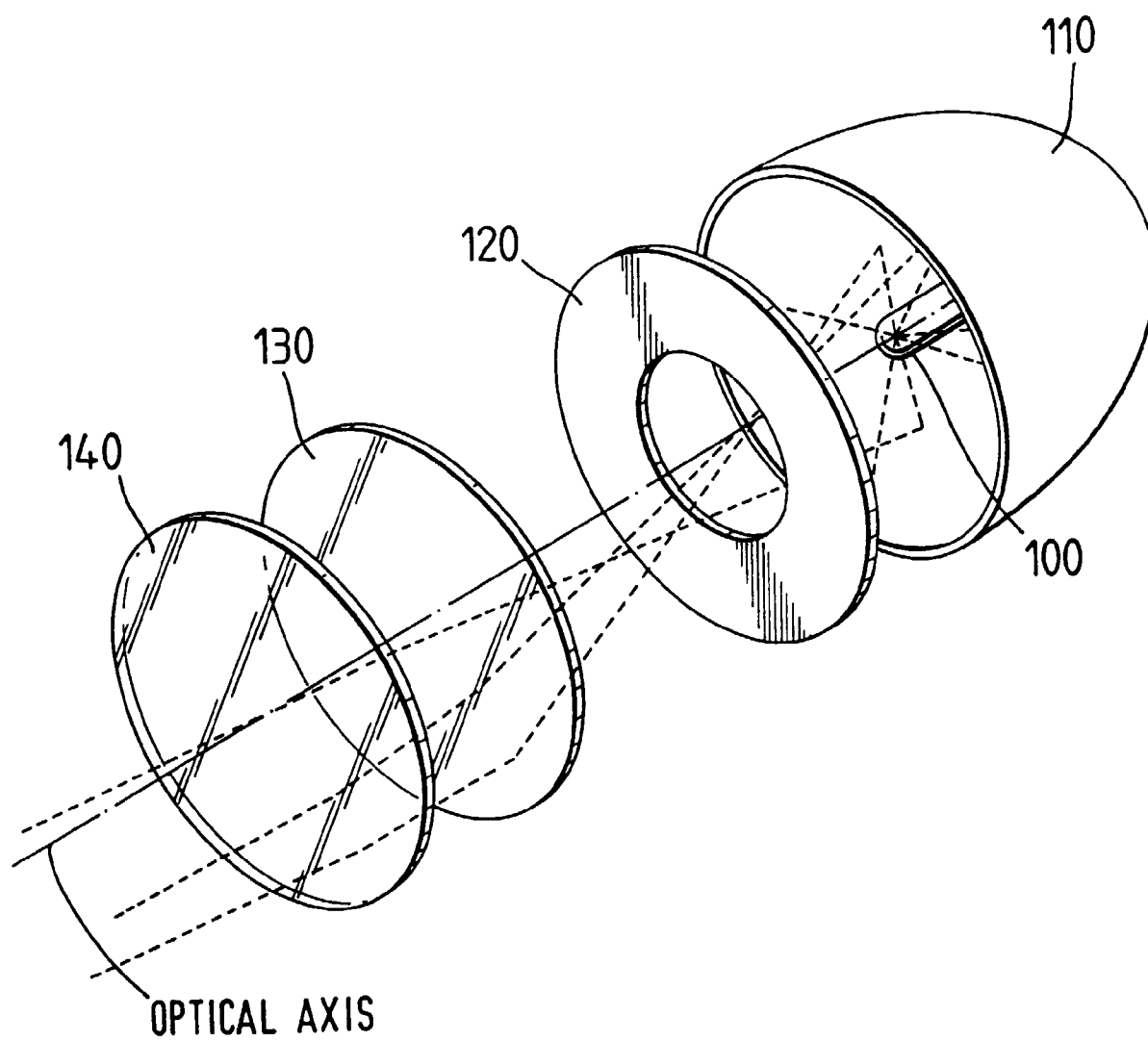


FIG. 2.
PRIOR ART

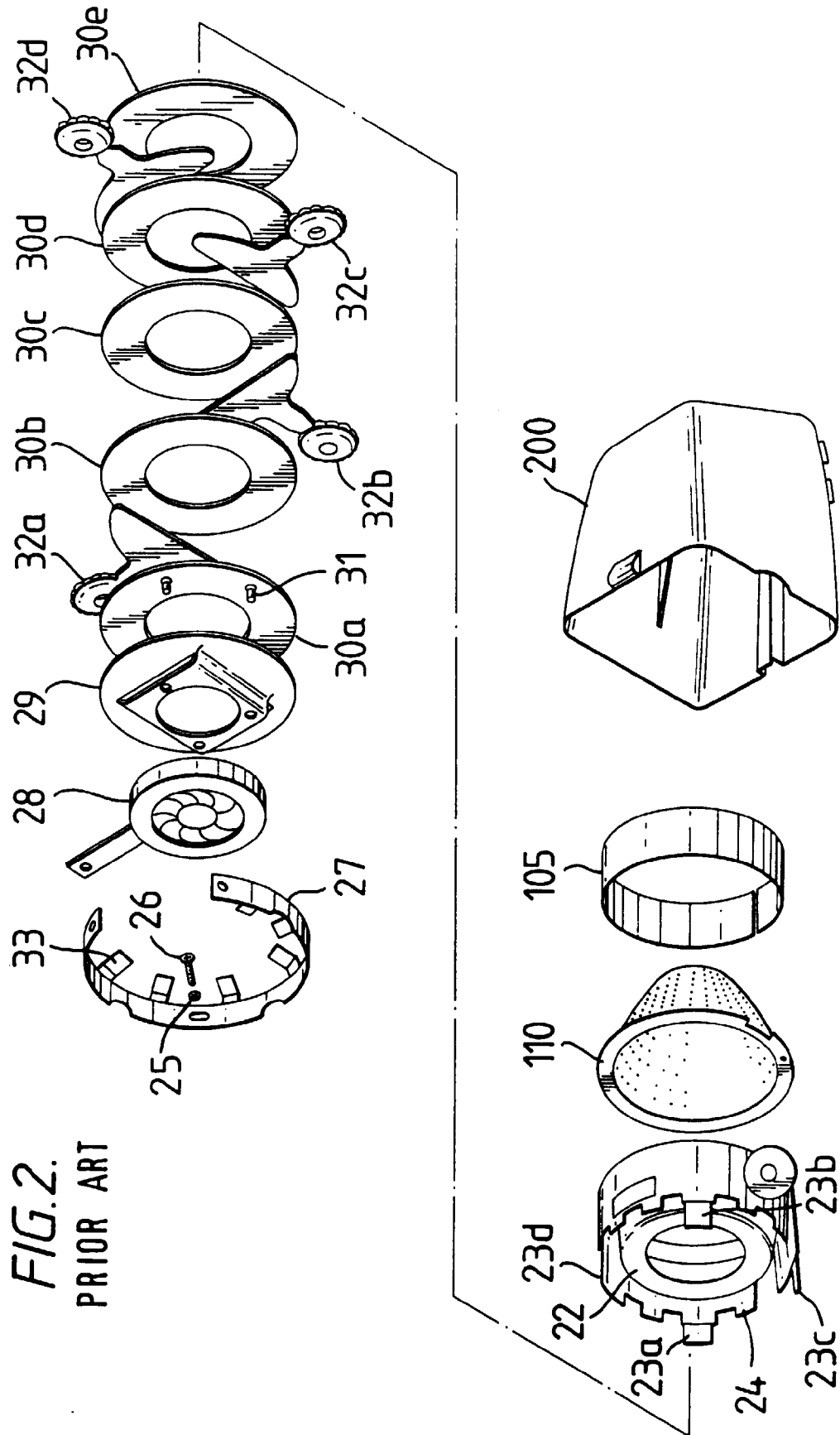


FIG. 3.

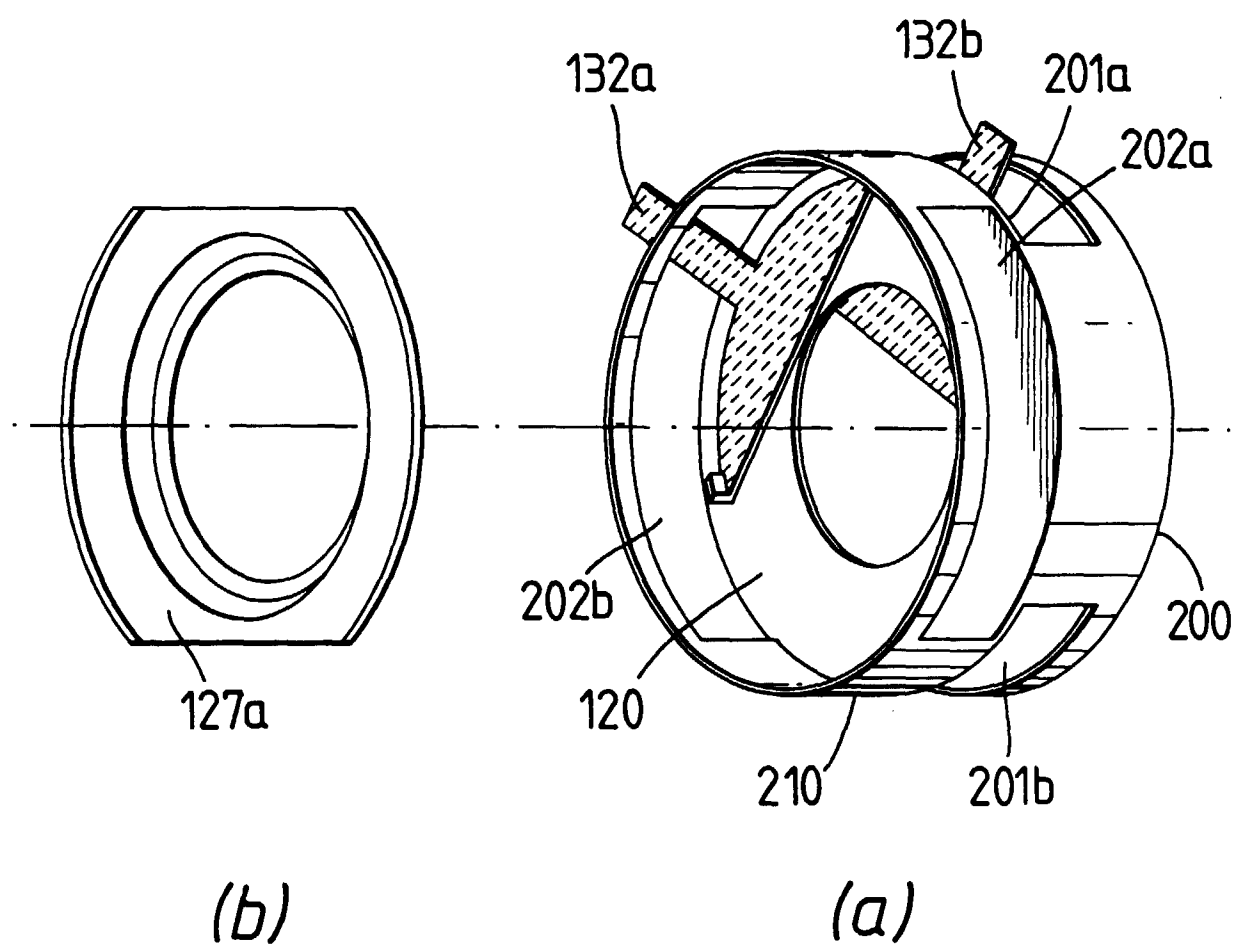


FIG. 4.

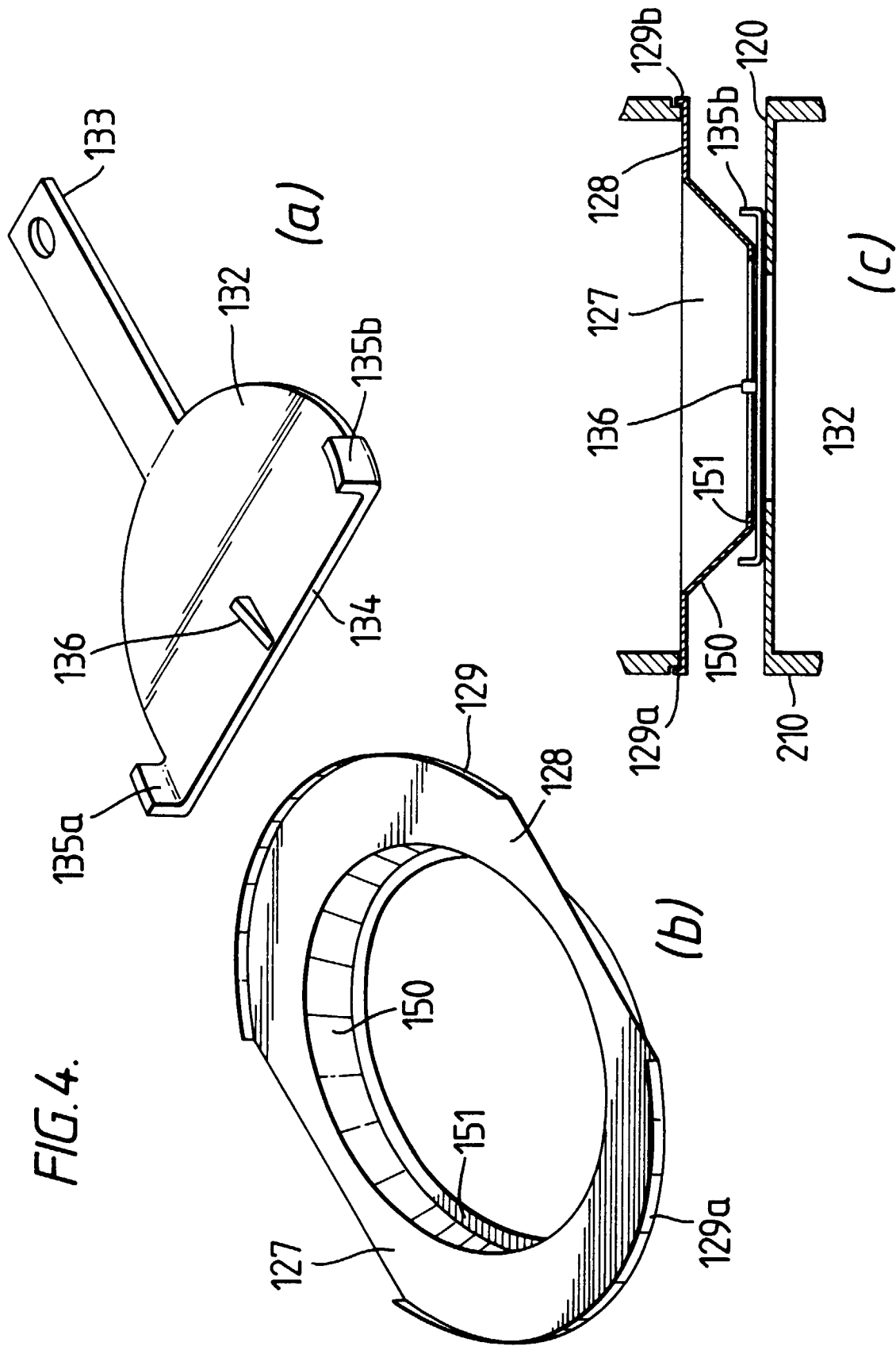
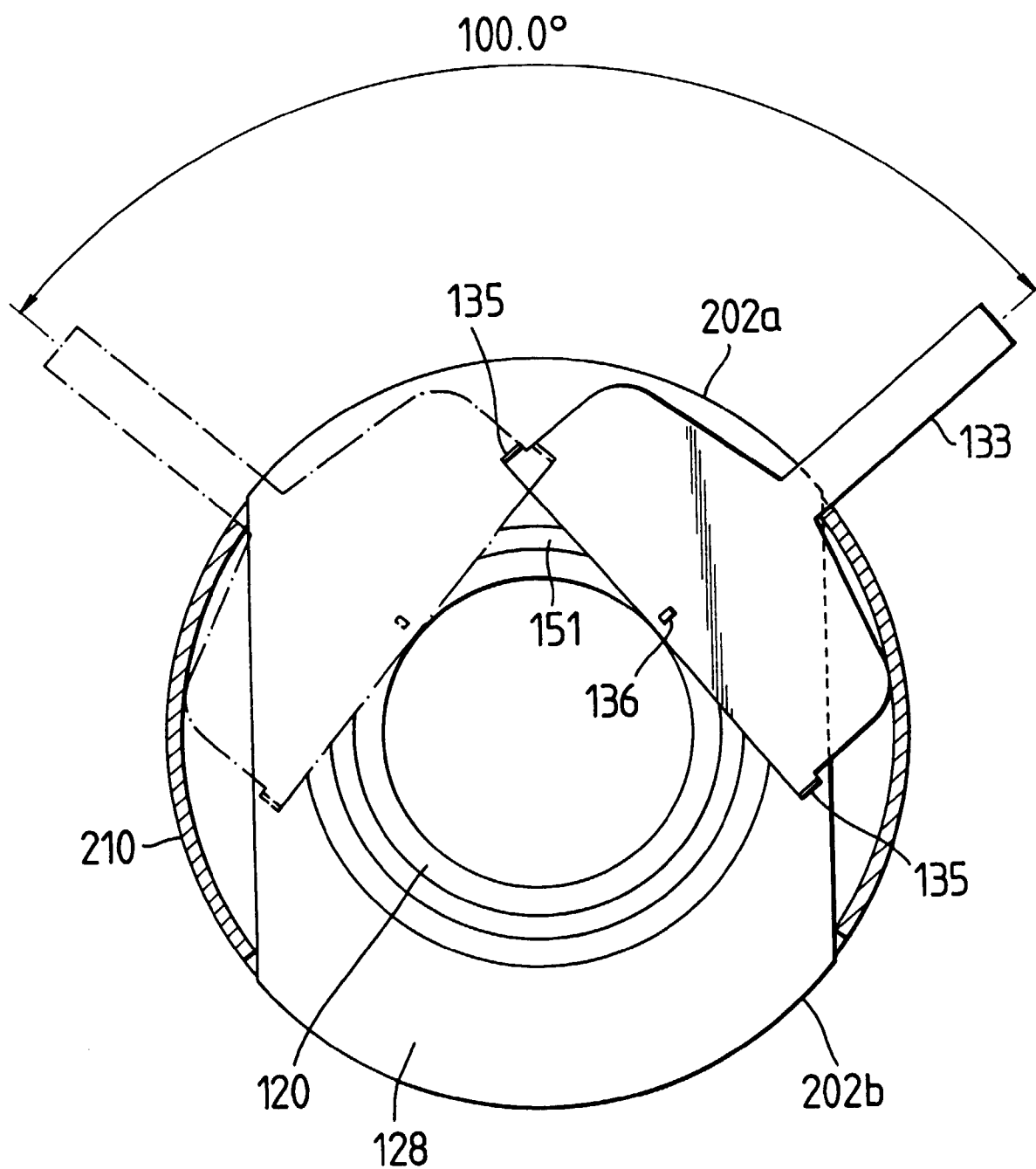


FIG. 5.



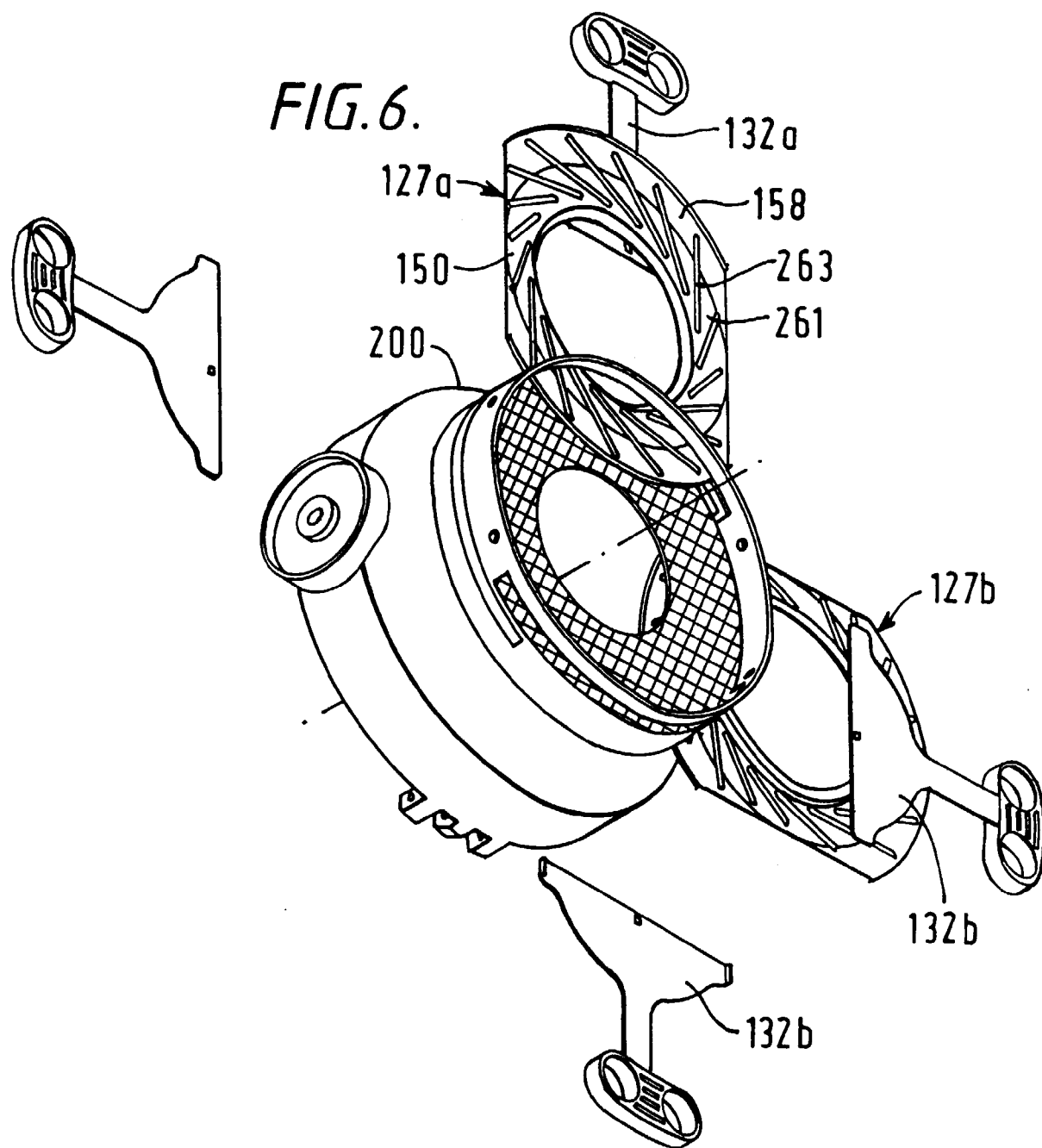


FIG. 7.

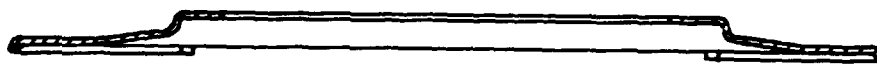


FIG. 8.

